

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Use of Spectrum Bands above 24 GHz For)	GN Docket No. 14-177
Mobile Radio Services)	

COMMENTS OF ERICSSON

Ericsson submits these comments in response to the *Fourth Further Notice of Proposed Rulemaking* in the above-captioned proceeding, in which the Commission seeks comment on ways to rationalize spectrum holdings in the 39 GHz band and modify the band plans for the Upper 37 GHz (37.6-38.6 GHz), 39 GHz, and 47 GHz bands.¹ Ericsson fully supports the Commission’s action to promote more efficient use of this valuable spectrum and to adopt policies that will enable an auction of this spectrum next year.

I. INTRODUCTION.

Ericsson commends the Commission for propelling the United States forward in the global race to 5G – in particular, the Commission’s commitment to making millimeter wave (“mmW”) spectrum available is vital to ensuring U.S. leadership in wireless broadband. The Commission has moved aggressively on mmW spectrum: it will auction the 28 GHz band in November 2018, to be followed immediately by an auction of 24 GHz spectrum, and Chairman

¹ *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Fourth Further Notice of Proposed Rulemaking, GN Docket No. 14-177, FCC 18-110 (rel. Aug. 3, 2018) (“*Fourth Further Notice*”).

Pai has announced that the Commission will auction the Upper 37 GHz, 39 GHz, and 47 GHz bands in 2019.²

The Commission's actions are more timely than ever: the June 2018 Ericsson Mobility Report found that total mobile data traffic in North America is expected to exceed 19 exabytes per month in 2023 (roughly eight times last year's traffic), at which point more than 48 percent of all mobile subscriptions in North America are forecast to be 5G.³ To meet this demand, 5G service providers will need to secure additional spectrum, and the *Fourth Further Notice* brings 5G providers another step closer to achieving this objective.

Ericsson is committed to doing its part to make 5G a reality for American consumers and to that end, Ericsson is boosting its U.S. investments in R&D and manufacturing to support accelerated 5G deployments.⁴ While Ericsson and its partners have spent years testing 5G technology in labs and in field trials, Ericsson is speeding the timeline to make 5G products available in the United States through its Austin ASIC Design Center in Austin, TX that focuses on 5G base stations and a new software development center that will focus on the baseband needed for 5G. Ericsson will soon begin manufacturing in United States and the first next-generation radios will be produced before the end of 2018.⁵ This series of strategic initiatives

² See *Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services*, Public Notice, FCC 18-43, ¶1 (rel. Apr. 17, 2018) (“*Auctions 101 and 102 Public Notice*”); Chairman Ajit Pai, *Coming Home*, FCC Blog (July 11, 2018, 1:35 pm), <https://www.fcc.gov/news-events/blog/2018/07/11/coming-home>.

³ Ericsson, *Ericsson Mobility Report* at 11, 15 (June 2018), <https://www.ericsson.com/assets/-local/mobility-report/documents/2018/ericsson-mobility-report-june-2018.pdf>.

⁴ See Ericsson, *Ericsson increasing US investments to support accelerated 5G deployments* (Aug. 10, 2018), <https://mb.cision.com/Main/15448/2589865/889576.pdf>.

⁵ *Id.*

will allow Ericsson to operate even closer to its customers, meeting the growing demand for 5G in the United States and globally.

II. ERICSSON COMMENDS THE COMMISSION FOR ITS PLAN TO AUCTION THE UPPER 37 GHz, 39 GHz, AND 47 GHz BANDS IN 2019 AND PROPOSES THAT THE 42 GHz BAND BE INCORPORATED IN THE SAME AUCTION.

The Commission is moving swiftly to release critical mmW spectrum – approximately 5 gigahertz – into the market to support 5G in the United States. Ericsson commends the Commission for scheduling the 28 GHz auction for November, to be followed immediately by the 24 GHz auction.⁶ And, Ericsson supports the Commission’s plans to auction the Upper 37 GHz, 39 GHz, and 47 GHz bands in 2019.⁷ It is important for industry to know the timeline for unleashing additional bands into the market, and Ericsson applauds the Commission for taking these important steps.

To ensure that the 2019 auction takes place without delay, Ericsson supports prompt Commission action in response to the *Fourth Further Notice* to rationalize incumbent holdings in the 39 GHz band. These actions will benefit existing product development efforts and provide regulatory certainty for operators and vendors – speeding the deployment of 5G services that will change the way consumers experience the world.

In its recent comments to the *Third Further Notice* in this proceeding, Ericsson urged the Commission to auction the 42 GHz (42.0-42.5 GHz) band along with the Upper 37 GHz band

⁶ See *Auctions 101 and 102 Public Notice*.

⁷ See *Fourth Further Notice*, Statement of Chairman Ajit Pai (reiterating plans to hold a single auction for the Upper 37 GHz, 39 GHz, and 47 GHz bands in the second half of 2019).

and the 39 GHz band, provided that the addition would not delay the existing auction plans.⁸

The 42 GHz band is within the tuning range of the 37 GHz and 39 GHz bands, generating economies of scale and reducing equipment costs. Licenses in the 42 GHz band should thus be considered as like-spectrum with Upper 37 GHz and 39 GHz licenses and should be part of the same auction “product” group.

III. ERICSSON SUPPORTS 100 MEGAHERTZ LICENSES SO LONG AS LICENSEES ARE PERMITTED TO AGGREGATE CONTIGUOUS LICENSE BLOCKS IN MULTIPLE-HUNDREDS OF MEGAHERTZ.

Ericsson supports the Commission’s proposal to modify the Upper 37 GHz, 39 GHz, and 47 GHz band plans to use 100-megahertz channels.⁹ Moving to 100-megahertz channels as proposed will further harmonize the U.S. Upper Microwave Flexible Use Service policies and facilitate the standardization of equipment throughout the mmW bands. In particular, adopting 100-megahertz channels for these three bands will bring the bands into alignment with the 24 GHz band, Lower 37 GHz band, and the proposed channel size for the 42 GHz band.¹⁰ And importantly, 100-megahertz channels in the 39 GHz band will better facilitate the repacking of incumbents, which is critical to reducing encumbrances and turning 39 GHz into a 5G band.

⁸ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking, FCC 18-73 (rel. June 8, 2018) (“*Third Report and Order*” or “*Third Further Notice*”); Comments of Ericsson at 10, GN Docket No. 14-177 (filed Sept. 10, 2018).

⁹ *Fourth Further Notice* ¶¶ 9, 11-12.

¹⁰ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988, 11000 ¶35 (2017); *Third Report and Order* at ¶28; *Third Further Notice* at ¶ 57 (proposing to license the 42 GHz band as 100 megahertz channels to be “consistent with developing industry standards that maximize spectral efficiency, all the while permitting interested parties to aggregate these channels should they desire larger bands”).

For 5G to reach its full potential, it is critical that carriers have the opportunity to aggregate mmW spectrum into contiguous wide-area channels, to the order of multiple hundreds of megahertz.¹¹ To that end, the *Fourth Further Notice* observes that 100-megahertz channels are consistent with 3GPP standards and serve as a “baseline” for 5G service.¹² Ericsson agrees with the Commission’s statement that “licensees [should be able to] aggregate to larger channel sizes (such as 200 megahertz, 300 megahertz, etc.).”¹³ It is likely that 5G will spur new use cases – unforeseen today – and 5G over mmW spectrum with ultra-wide channels will deliver new efficiencies and new applications.¹⁴ Thus, the Commission should facilitate 100 megahertz-channel aggregation through its service and auction rules.

¹¹ As an example, Sprint announced plans to utilize “super wide channels” or 160 MHz for its 2.5 GHz Massive MIMO network. *See e.g.*, Jeremy Horwitz, Venturebeat, *Sprint commits to launching mobile 5G nationwide in 2019, raising prices* (Feb. 2, 2018), <https://venturebeat.com/2018/02/02/sprint-commits-to-launching-mobile-5g-nationwide-in-2019-raising-prices/>. In its comments on the *Further Notice*, Ericsson supported allowing licensees in the Lower 37 GHz to aggregate up to the full 600 MHz in the band. *See Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 (2016); Comments of Ericsson at 17, GN Docket 14-177 (filed Sept. 30, 2016).

¹² *Fourth Further Notice* at ¶ 10.

¹³ *Id.*

¹⁴ *See e.g.*, Ericsson, *5G deployment considerations* at 2 (2018), <https://www.ericsson.com/assets/local/narratives/networks/documents/5g-deployment-considerations.pdf>. It is possible that future 5G applications could require multiple-Gbps peak throughput.

IV. ERICSSON SUPPORTS THE GOALS OF ELIMINATING LICENSE FRAGMENTATION AND DRIVING TOWARD MORE CONTIGUOUS HOLDINGS IN THE 39 GHz BAND.

Ericsson lauds the Commission's goals in the *Fourth Further Notice* of rationalizing the licenses and reducing fragmentation in the 39 GHz band.¹⁵ The 39 GHz band is an essential band for 5G in the United States, but the fragmented incumbent holdings in the band currently impede its usefulness as a foundational band for 5G services. As Commissioner Carr aptly described it, 39 GHz currently consists of "50 MHz pairs scattered across the band and a Swiss cheese map of overlapping geographies."¹⁶ The band is highly fragmented both in terms of geography and frequency, meaning that that in many cases, operators have non-contiguous holdings spread across the entire 1.4 GHz band. Ericsson supports a reconfiguration of the band that will drive toward more contiguous swaths of spectrum that can be used to support wireless broadband deployment, including 5G. Eliminating fragmentation is particularly important to support mmW 5G product development. Contiguity across the band support economies of scale that ultimately drive down prices since manufacturers need not develop products to support noncontiguous holdings.

¹⁵ See generally *Fourth Further Notice*.

¹⁶ *Fourth Further Notice*, Statement of Commissioner Brendan Carr.

V. CONCLUSION.

Ericsson applauds the Commission for moving forward with the *Fourth Further Notice* and urges swift action to enable an auction of valuable mmW spectrum next year.

Respectfully Submitted,

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